

Page 1 of 3

U.S. APPLICATION NO. <b>107 089965</b>		INTERNATIONAL APPLICATION NO. PCT/GB00/04002		ATTORNEY DOCKET NO. 216189	
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20. <input checked="" type="checkbox"/> The following fees are submitted: <b>Basic National Fee (37 CFR 1.492(a)(1)-(5)):</b> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO ..... \$1,040.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO ..... \$ 890.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO, but international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$ 740.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4)..... \$ 710.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1) to (4) ..... \$ 100.00				CALCULATIONS	PTO USE ONLY
<b>ENTER APPROPRIATE BASIC FEE AMOUNT=</b>				\$1,040.00	
Surcharge of \$130.00 for furnishing the National fee or oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date				\$	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total Claims	9 -20=	0	x \$ 18.00	\$0.00	
Independent Claims	2 - 3 =	0	x \$ 84.00	\$0.00	
<input type="checkbox"/> Multiple Dependent Claim(s) (if applicable)				+\$280.00	\$0.00
<b>TOTAL OF ABOVE CALCULATIONS=</b>				\$1,040.00	
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.				\$	
<b>SUBTOTAL=</b>				\$1,040.00	
Processing fee of \$130.00 for furnishing English Translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date.				\$	
<b>TOTAL NATIONAL FEE=</b>				\$1,040.00	
Fee for recording the enclosed assignment. The assignment must be accompanied by an appropriate cover sheet. \$40.00 per property				+	\$
<b>TOTAL FEE ENCLOSED=</b>				\$1,040.00	
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a. ☒ A check in the amount of \$1,040.00 to cover the above fee is enclosed.


b. ☐ Please charge Deposit Account No. 12-1216 in the amount of \$ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 12-1216. A duplicate copy of this sheet is enclosed.

**NOTE:** Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.


SEND ALL CORRESPONDENCE TO:

Customer Number: 23460



**23460**

PATENT TRADEMARK OFFICE



Gordon R. Coons, Registration No. 20821  
One of the Attorneys for Applicant(s)

Date: April 8, 2002

U.S. APPLICATION NO.	INTERNATIONAL APPLICATION NO. PCT/GB00/04002	ATTORNEY DOCKET NO. 216189
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**CERTIFICATION UNDER 37 CFR 1.10**

"Express Mail" Label Number: EL841132881US

Date of Deposit: April 8, 2002

I hereby certify that this express request to begin national examination procedures under 35 USC 371(f) of the International Patent Application referenced above, including all of the items listed thereon as enclosures, is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" Service under 37 CFR 1.10 on the date indicated above and is addressed to Box PCT, Commissioner for Patents, Attention: DO/EO/US, Washington, D.C. 20231.

  
Printed Name of Person Signing:

  
Signature

**PATENT**  
Attorney Docket No. 216189

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:

Jacques DUMINY

Art Unit: Unassigned

Corresponding to International  
Application No. PCT/GB00/04002

Examiner: Unassigned

Filed: Concurrently

For: SEALING STRIPS

**PRELIMINARY AMENDMENT**

Commissioner for Patents  
Washington, D.C. 20231

Dear Sir:

Prior to the examination of the above-identified patent application, please enter the following amendments and consider the following remarks.

**AMENDMENTS**

***IN THE CLAIMS:***

Replace claims 1-9, as amended in the International Preliminary Examination Report, with the following:

1. (Amended) A strip of flexible thermoplastic elastomer material of open-cell foamed form having a first, thin closed-cell covering thereover, characterised by a second thin covering on the outside of the first covering, the second covering presenting an outwardly facing surface having a lower coefficient of friction than the first covering.
2. (Amended) A strip according to claim 1, in which the second covering is made of plastic or rubber material.

In re Appln. of Duminy  
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3. (Amended) A strip according to claim 1, of hollow tubular form.
4. (Amended) A strip according to claim 1, attached to a longitudinally extending mounting part for mounting the strip adjacent a movable member to be compressed thereby to provide a sealing function.
5. (Amended) A strip according to claim 4, in which the mounting part is also made of thermoplastic elastomer material and the first covering extends thereover.
6. (Amended) A strip according to claim 5, in which the second covering extends over the first covering on the mounting part.
7. (Amended) A strip according to claim 1, in which the thermoplastic elastomer material and the two coverings are produced by extrusion.
8. (Amended) A strip according to claim 5, in which the thermoplastic elastomer material of the strip and of the mounting part is co-extruded and in which at least the first covering on the strip and on the mounting part is co-extruded.
9. (Amended) A method of making a sealing strip, comprising the steps of extruding thermoplastic elastomer material in foamed open-cell form, and extruding a first thin covering of closed-cell material onto at least a part of the outer surface of the

In re Appln. of Duminy  
Corres. to Int'l. Appln. No. PCT/GB00/04002

open-cell material, characterised by the step of extruding a second, thin covering onto at least part of the outside of the first covering, the second covering presenting an outwardly facing surface having a lower coefficient of friction than the first covering.



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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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Art Unit: Unassigned

Examiner: Unassigned

Filed: Concurrently

For: SEALING STRIPS

**AMENDMENTS TO CLAIMS  
MADE VIA PRELIMINARY AMENDMENT**

*IN THE CLAIMS:*

Please amend claims 1-10 as follows:

1. (Amended) A strip [(6)] of flexible thermoplastic elastomer material [(22)] of open-cell foamed form having a first, thin closed-cell covering [(24)] thereover, characterised by a second thin covering [(26)] on the outside of the first covering [(24)], the second covering [(26)] presenting an outwardly facing surface having a lower coefficient of friction than the first covering [(24)].
2. (Amended) A strip [(6)] according to claim 1, in which the second covering [(26)] is made of plastic or rubber material.
3. (Amended) A strip [(6)] according to claim 1 [or 2], of hollow tubular form.



In re Appln. of Duminy  
Corres. to Int'l. Appln. No. PCT/GB00/04002

4. (Amended) A strip [(6)] according to [any preceding] claim 1, attached to a longitudinally extending mounting part [(10)] for mounting the strip [(6)] adjacent a movable member to be compressed thereby to provide a sealing function.

5. (Amended) A strip [(6)] according to claim 4, in which the mounting part [(10)] is also made of thermoplastic elastomer material [(16)] and the first covering [(24)] extends thereover.

6. (Amended) A strip [(6)] according to claim 5, in which the second covering [(26)] extends over the first covering [(24)] on the mounting part [(10)].

7. (Amended) A strip [(6)] according to [any preceding] claim 1, in which the thermoplastic elastomer material [(22)] and the two coverings [(24,26)] are produced by extrusion.

8. (Amended) A strip [(6)] according to claim 5 [or 6], in which the thermoplastic elastomer material [(22)] of the strip [(6)] and of the mounting part [(10)] is co-extruded and in which at least the first covering [(24)] on the strip [(6)] and on the mounting part [(10)] is co-extruded.

9. (Amended) A method of making a sealing strip [(6)], comprising the steps of extruding thermoplastic elastomer material [(22)] in foamed open-cell form, and

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Corres. to Int'l. Appln. No. PCT/GB00/04002

extruding a first thin covering [(24)] of closed-cell material onto at least a part of the outer surface of the open-cell material [(22)], characterised by the step of extruding a second, thin covering [(26)] onto at least part of the outside of the first covering [(24)], the second covering [(26)] presenting an outwardly facing surface having a lower coefficient of friction than the first covering [(24)].

**PATENT**  
Attorney Docket No. 216189

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:

Jacques DUMINY

Corresponding to International  
Application No. PCT/GB00/04002

Art Unit: Unassigned

Examiner: Unassigned

Filed: Concurrently

For: SEALING STRIPS

**PENDING CLAIMS AFTER ENTRY OF PRELIMINARY AMENDMENT**

1. A strip of flexible thermoplastic elastomer material of open-cell foamed form having a first, thin closed-cell covering thereover, characterised by a second thin covering on the outside of the first covering, the second covering presenting an outwardly facing surface having a lower coefficient of friction than the first covering.
2. A strip according to claim 1, in which the second covering is made of plastic or rubber material.
3. A strip according to claim 1, of hollow tubular form.
4. A strip according to claim 1, attached to a longitudinally extending mounting part for mounting the strip adjacent a movable member to be compressed thereby to provide a sealing function.

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5. A strip according to claim 4, in which the mounting part is also made of thermoplastic elastomer material and the first covering extends thereover.
6. A strip according to claim 5, in which the second covering extends over the first covering on the mounting part.
7. A strip according to claim 1, in which the thermoplastic elastomer material and the two coverings are produced by extrusion.
8. A strip according to claim 5, in which the thermoplastic elastomer material of the strip and of the mounting part is co-extruded and in which at least the first covering on the strip and on the mounting part is co-extruded.
9. A method of making a sealing strip, comprising the steps of extruding thermoplastic elastomer material in foamed open-cell form, and extruding a first thin covering of closed-cell material onto at least a part of the outer surface of the open-cell material, characterised by the step of extruding a second, thin covering onto at least part of the outside of the first covering, the second covering presenting an outwardly facing surface having a lower coefficient of friction than the first covering.

SEALING STRIPS

The invention relates to sealing strips. Sealing strips embodying the invention, and to be described in more detail below by way of example only, are for use in carrying out sealing functions in motor vehicle body construction.

It is known to provide sealing strips which are a composite of rubber or thermoplastic layers. EP0836962 (Draftex Industries Limited) illustrates such a strip. However, such composite layer strips may be susceptible to wear and provide unacceptable performance in locations where there is surface slide, eg. about door hinges.

According to the invention, there is provided a strip of flexible thermoplastic elastomer material having a first, thin closed-cell covering thereover, the strip characterised in that there is a second thin covering on the outside of the first covering, the second covering presents an outwardly facing surface having a lower coefficient of friction than the first covering.

According to the invention, there is also provided a method of making a sealing strip, comprising the steps of extruding and foaming thermoplastic elastomer material, extruding a first thin covering of closed-cell material onto at least part of the outer surface of the thermoplastic elastomer material, the method characterised in that there is extruded a second, thin covering onto at least part of the outside of the first covering, the second

covering being presented by the materials as an outwardly facing surface having a lower coefficient of friction than the first covering.

Sealing strips embodying the invention, for use in carrying out sealing functions in motor vehicle bodies, will now be described, by way of example only, with reference to the accompanying diagrammatic drawings in which:

Figure 1 is a perspective view of a motor vehicle to which the sealing strips may be fitted; and

Figure 2 is a perspective view of one of the sealing strips in cross-section.

Figure 1 shows a motor vehicle body 5 with one of its doors removed to show a sealing strip 6 mounted around the periphery of the door opening. In use, the closing door closes onto the sealing strip 6 to provide a weather-tight seal.

One form of the sealing strip 6 is shown in Figure 2. It comprises a sealing portion 8 and a gripping or mounting portion 10. The gripping portion 10 is in the form of a longitudinal channel 12. In use, this is embracingly clamped to the surround of the door opening. More specifically, the surround of the door opening is normally defined by a flange where the inner and outer body panels are welded together.

As shown in Figure 2, the gripping portion 10 comprises a reinforcing core or carrier 14 such as made of resilient metal or other material, which is embedded in flexible material 16 such as rubber or plastics material. For example, the carrier 14 may be made of metal and in the form of (inverted) U-shaped elements arranged side-by-side to define the channel 12 and connected together by integral short connecting links or disconnected from each other. Other forms of carrier are, of course, possible. The carrier may be made of wire looped to and fro. The carrier 14 may be incorporated in the material 16 using a cross-head extruder. The carrier need not be made of metal. A flexible but substantially non-extensible tape may be incorporated into the material 16.

The material 16 is formed to define integral gripping lips 18 positioned on the opposite inside facing walls of the channel 12. These make contact with the opposite faces of the flange and increase the frictional gripping of the gripping portion 10. Advantageously, the material of the lips 18 is arranged to be softer than the remainder of the extruded material 16 to increase the frictional grip of the lips against the flange.

As shown in Figure 2, the material 16 is formed to define a so-called "cosmetic lip" 20. This is used to cover over, and to help to secure, the edge of a trim panel or the like inside the vehicle body.

The gripping portion 10 may be provided with a fabric covering 21.

The sealing portion 8 is of generally hollow tubular form. It comprises soft cellular material 22 forming a relatively thick tubular wall. Advantageously, the material 22 is extruded thermoplastic elastomer (TPE) material which is foamed by a suitable method such as with the use of water or by means of a chemical foaming agent. The wall made from material 22 is thus very soft and also very light in weight. In order to provide a protective covering over the hollow cells of the material 22 which may be of open-cellular form, it is covered by a thin extruded covering layer or skin 24 using a suitable known method to produce a thin covering of closed-cellular form.

The sealing portion 8 is attached to the gripping portion 10 by any suitable method.

However, instead, the extruded material 16 of the gripping portion 10 may also be made of soft cellular extruded TPE material similar to the material 22, foamed in the same way, and co-extruded with the material 22. In such a case, the thin skin 24 would extend over the outside surface of the material 16 of the gripping portion 10.

In use, the gripping portion 10 mounts the sealing strip on the door surround, so that the sealing portion 8 extends around the door opening, on the outside of the vehicle body. The closing door thus partially compresses the sealing portion 10 which thereby provides a weather-tight seal. When mounted in this way, the mouth of the channel 12 will of course face away from the centre of the door opening.



Although the use of TPE material for the sealing portion 8 (and possibly also for the gripping portion 10) is found to be very advantageous, being in particular very light in weight, the skin 24, which is required in order to cover the cells of the material 22, is found to present a relatively high friction surface. This may be disadvantageous in certain circumstances. For example, the closing vehicle door will partially slide across the surface of the sealing portion 8, particularly adjacent the "A" pillar of the vehicle where it is hinged. High friction contact at this position can cause problems.

In accordance with a feature of the embodiment being described, therefore, the sealing portion 8 is provided with an additional, external, skin 26 which is extruded over the outside of the skin 24 and is arranged to provide a low friction external surface. The skin 26 may be any suitable material, film or coating, such as plastics or rubber, extruded for example. Extruded hard rubber, or similar material may be used. Important requirements for the skin 26 are good adhesion to skin 24 and a low or lower coefficient of friction compared to that skin 24. Thus, a wide range of appropriately formulated and friction-tuned materials may be used.

In this way, the advantages of TPE material are preserved and the disadvantage of the relatively high friction surface of the skin 24 is overcome.

It will be appreciated that the sealing section 8, with the skins 24 and 26 thereon, can have any suitable shape. For example, it may be in the form of a lip instead of a tube. Instead

of being used as a door seal, it may be used, for example, as a waist seal for the window opening of a vehicle door. In such a case, the low friction surface of the skin 26 is particularly advantageous.

The skin 26 can extend over the outside surface of the gripping section 10. However, the sealing section 8 need not be attached to a gripping section.

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REVISED CLAIMS

1. A strip (6) of flexible thermoplastic elastomer material (22) of open-cell foamed form having a first, thin, closed-cell covering (24) thereover, characterised by a second thin covering (26) on the outside of the first covering (24), the second covering (26) presenting an outwardly facing surface having a lower coefficient of friction than the first covering (24).
2. A strip (6) according to claim 1, in which the second covering (26) is made of plastics or rubber material.
3. A strip (6) according to claim 1 or 2, of hollow tubular form.
4. A strip (6) according to any preceding claim, attached to a longitudinally extending mounting part (10) for mounting the strip (6) adjacent a movable member to be compressed thereby to provide a sealing function.
5. A strip (6) according to claim 4, in which the mounting part (10) is also made of thermoplastic elastomer material (16) and the first covering (24) extends thereover.
6. A strip (6) according to claim 5, in which the second covering (26) extends over the first covering (24) on the mounting part (10).
7. A strip (6) according to any preceding claim, in which the thermoplastic elastomer material (22) and the two coverings (24,26) are produced by extrusion.
8. A strip (6) according to claim 5 or 6, in which the thermoplastic elastomer material (22) of the strip (6) and of the mounting part (10) is co-extruded and in which at least the first covering (24) on the strip (6) and on the mounting part (10) is co-extruded.

9. A method of making a sealing strip (6), comprising the steps of extruding thermoplastic elastomer material (22) in foamed open-cell form, and extruding a first thin covering (24) of closed-cell material onto at least a part of the outer surface of the open-cell material (22), characterised by the step of extruding a second thin covering (26) onto at least part of the outside of the first covering (24), the second covering (26) presenting an outwardly facing surface having a lower coefficient of friction than the first covering (24).

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

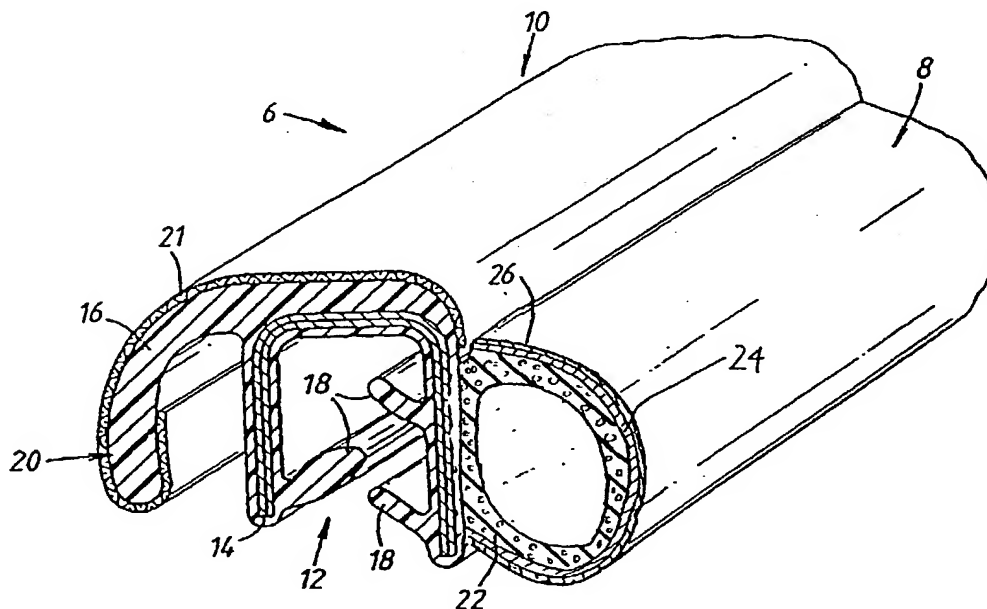
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- (71) Applicant (for all designated States except US):  
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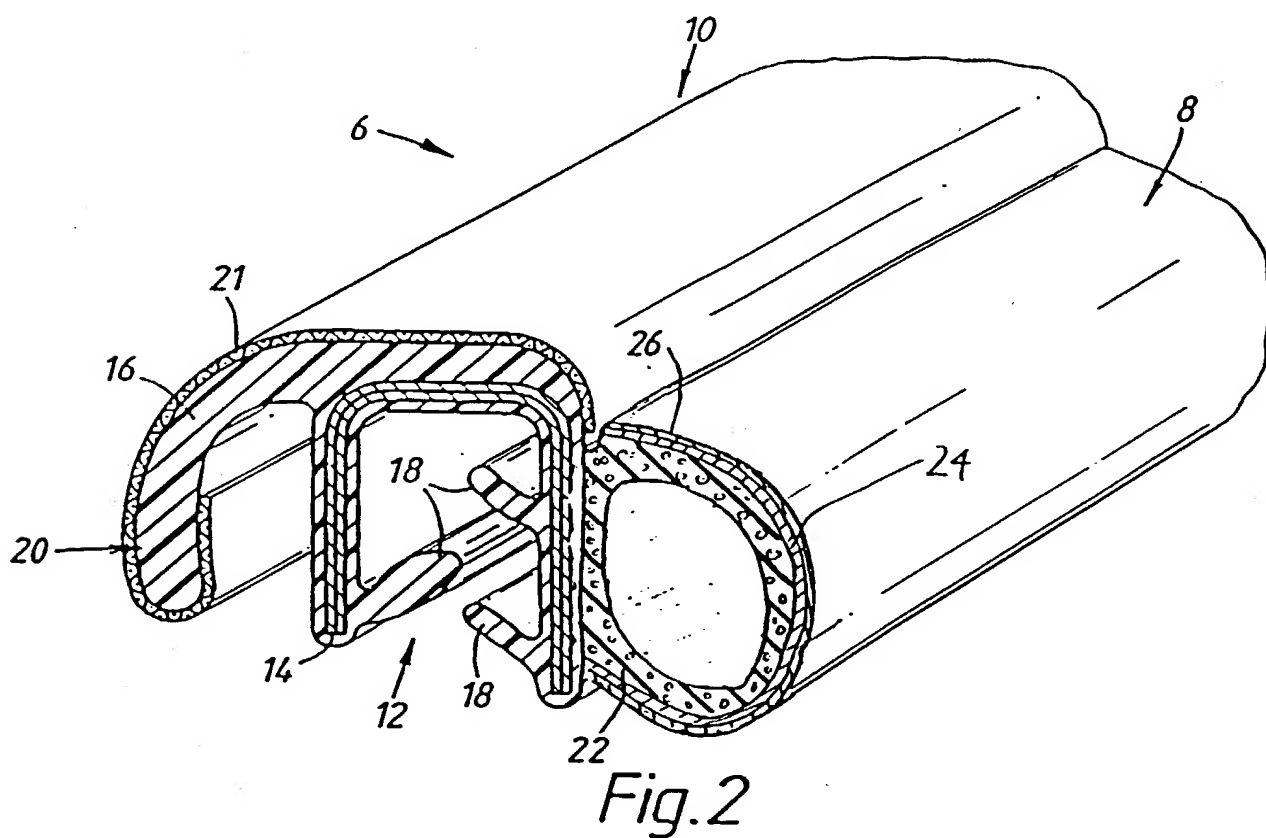
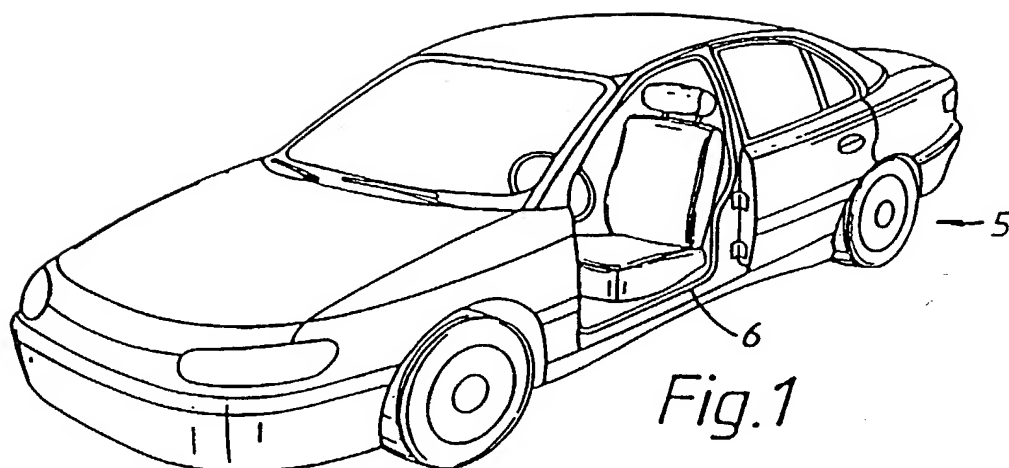
(54) Title: SEALING STRIPS



(57) Abstract: A sealing strip (6), such as for a vehicle door frame, comprises a gripping part (10) of channel-shape and a tubular sealing part (8). The sealing part (8) is made of foamed or cellular thermoplastic elastomer material (22) which is very soft to improve the sealing properties of the strip and to reduce weight. A protective skin (24) of closed-cell form is extruded over the outside surface of the material (22). In order to provide a low friction outer surface, a second skin (26) of suitable low friction material such as rubber is extruded over the first skin (24).

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1/1



## PATENT

Attorney's Docket No. 216189

## COMBINED DECLARATION AND POWER OF ATTORNEY

As below named inventor, I hereby declare that

This declaration is of the following type:

- ☐ original ☐ design ☐ supplemental  
☒ national stage of PCT  
☐ divisional ☐ continuation ☐ continuation-in-part

My residence, post office address, and citizenship are as stated below next to my name. I believe I am the original, first, and sole inventor (*if only one name is listed below*) or an original, first, and joint inventor (*if plural names are listed below*) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

the specification of which:

- ☐ is attached hereto.  
☐ was filed on \_\_\_\_\_ as Application No. \_\_\_\_\_ and was amended on \_\_\_\_\_  
 (*if applicable*).  
☐ was filed by Express Mail No. \_\_\_\_\_ as Application No. *not known yet*, and was amended on \_\_\_\_\_  
 (*if applicable*).  
☒ was described and claimed in PCT International Application No. GB00/04002 filed on  
 18 October 2000 and as amended pursuant to PCT Article 19 on \_\_\_\_\_  
 (*if any*).

I state that I have reviewed and understand the contents of the above-identified specification, including the claim(s), as amended by any amendment referred to above.

I acknowledge the duty to disclose information that is material to the patentability of this application in accordance with 37 C.F.R. § 1.56.

I claim foreign priority benefits under 35 U.S.C. § 119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent, utility model, design registration, or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

PRIOR FOREIGN PATENT, UTILITY MODEL, AND DESIGN REGISTRATION APPLICATIONS						
COUNTRY	APPLICATION	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 U.S.C. § 119			
UNITED KINGDOM	9924605.0	18 October 1999	X	YES		NO
				YES		NO
				YES		NO

I claim the benefit pursuant to 35 U.S.C. § 119(e) of the following United States provisional application(s):

In re Appln. of  
Attorney Docket No.

PRIOR U.S. PROVISIONAL APPLICATIONS BENEFIT CLAIMED UNDER 35 U.S.C. 119(e)	
APPLICATION NO.	DATE OF FILING (day,month,year)

I claim the benefit pursuant to 35 U.S.C. § 120 of any United States application(s) or PCT international application(s) designating the United States of America listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose material information as defined in 37 C.F.R. § 1.56 effective between the filing date of the prior application(s) and the national or PCT international filing date of this application.

PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL PATENT APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. 120					
U.S. APPLICATIONS			Status (check one)		
APPLICATION NO.	U.S. FILING DATE	PATENTED	PENDING	ABANDONED	
1. 0 /					
2. 0 /					
3. 0 /					
PCT APPLICATIONS DESIGNATING THE U.S.			Status (check one)		
PCT APPLICATION NO.	PCT FILING DATE (day,month,year)	U.S. APPLN. NOS. ASSIGNED (if any)	PATENTED	PENDING	ABANDONED
4. GB00/04002	18 Oct 2000				
5.					
6.					

DETAILS OF FOREIGN APPLICATIONS FROM WHICH PRIORITY CLAIMED UNDER 35 U.S.C. § 119 FOR ABOVE LISTED U.S./PCT APPLICATIONS				
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1. GB00/04002	United Kingdom	9924605.0	18 Oct 1999	
2.				
3.				
4.				
5.				
6.				



In re Appln. of  
Attorney Docket No.

As a named inventor, I hereby appoint Leydig, Voit & Mayer, Ltd. to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: Customer Number 23460.



**23460**

PATENT TRADEMARK OFFICE

I further direct that correspondence concerning this application be directed to Leydig, Voit & Mayer, Ltd.: Customer Number 23460.



**23460**

PATENT TRADEMARK OFFICE

I declare that all statements made herein of my own knowledge are true, that all statements made on information and belief are believed to be true, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

1-00

Full name of sole or first inventor: Jacques Duminy

Inventor's signature X

Date X 2 December 2002

Country of Citizenship:  
France

Residence: Schwabisch-Gmund, Germany  
(city/state or country)

DEX

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(complete mailing address)

Full name of second joint inventor, if any:

Inventor's signature \_\_\_\_\_

Date \_\_\_\_\_

Country of Citizenship:

Residence:  
(city/state or country)

Post Office Address:  
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Application deficiencies found during scanning:

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